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AN IBM 704 COMPUTER PROGRAM
FOR POLYNOMIAL COMPUTED POINTS

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We have a program for the IBM 704 computer which will solve a polynomial equation and compute values for a table of timber volumes. The program can be used for a number of similar problems, for example, to construct rating tables. The program computes points for the following equation:

$$Y = b_1 + b_2 X + b_3 X^2 + b_4 X^3 + b_5 X^4 + b_6 X^5 + b_7 X^6 + b_8 Q + b_9 QX + b_{10} QX^2 + b_{11} QX^3 + b_{12} QX^4 + b_{13} QX^5 + b_{14} QX^6 + b_{43} Q^6 + b_{44} Q^6 X + b_{45} Q^6 X^2 + b_{46} Q^6 X^3 + b_{47} Q^6 X^4 + b_{48} Q^6 X^5 + b_{49} Q^6 X^6 + b_{50} Z + b_{51} ZX + b_{52} ZX^2 + b_{53} ZX^3 + b_{54} ZX^4 + b_{55} ZX^5 + b_{56} ZX^6 + b_{57} ZQ + b_{58} ZQX + b_{59} ZQX^2 + b_{60} ZQX^3 + b_{61} ZQX^4 + b_{62} ZQX^5 + b_{63} ZQX^6 + b_{92} ZQ^6 + b_{93} ZQ^6 X + b_{94} ZQ^6 X^2 + b_{95} ZQ^6 X^3 + b_{96} ZQ^6 X^4 + b_{97} ZQ^6 X^5 + b_{98} ZQ^6 X^6 + b_{99} Z^2 + b_{100} Z^2 X + + \dots + + \dots + + \dots + + \dots + + \dots + b_{106} Z^2 Q + + \dots + + \dots + + \dots + + \dots + + \dots + b_{337} Z^6 Q^6 + b_{338} Z^6 Q^6 X + b_{339} Z^6 Q^6 X^2 + b_{340} Z^6 Q^6 X^3 + b_{341} Z^6 Q^6 X^4 + b_{342} Z^6 Q^6 X^5 + b_{343} Z^6 Q^6 X^6$$

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For any problem the coefficients B_m , $m = 1, 2, \dots, 343$, are set, giving a specific equation. This equation may then be solved for Y in terms of X , Q , and Z .

The IBM 704 Computer Program has been written to compute values of Y for one (X_i), two (X_i and Q_j), or three (X_i , Q_j , and Z_k) variables. Each variable, X_i , Q_j , Z_k , is associated with a range of values. These ranges are; for X_i , $i = 1, 2, \dots, 10$; for Q_j , $j = 1, 2, \dots, L$ where $1 \leq L \leq 25$; for Z_k , $k = 1, 2, \dots, N$ where $1 \leq N \leq 25$. These ranges may begin with any given value and are incremented by any constant. Any number of problems may be run at one time; each time giving the starting X , Q , and Z with the corresponding increments. This provides an unlimited range for X_i , Q_j , Z_k which would be suitable for plotting.

Both natural log and log to the base ten transformations are optional. Under these options the logarithmic values of Y are printed, followed by their antilogs on the next page.

A copy of the FORTRAN program deck, the BCD program deck, a sample problem, and operating instructions may be obtained by writing to the:

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